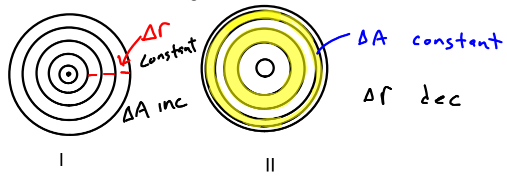
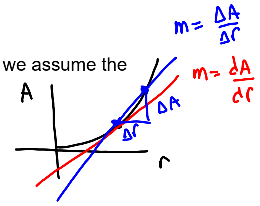
3.4b Other rates of change



Which model best illustrates tree growth if we assume the same amount of new growth each year?



$A = \pi r^2$

$\frac{\Delta A}{\Delta r} \approx \frac{dA}{dr} = 2\pi r$

$\frac{\Delta A}{\Delta r} \approx 2\pi r$ inc dec

$\Delta A \approx 2\pi r \, \Delta r$

constant

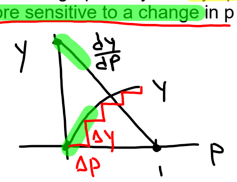
Sep 20-5:53 PM

Ex 6 p 133 Sensitivity to change in genetics

p=proportion of a dominant gene in a population
1-p=proportion of the recessive gene
y=proportion of dominant gene in the next generation

y = 2p-p^2 $\quad \frac{dy}{dp} = 2-2p$

Compare the graphs of y and dy/dp to determine what values of y are more sensitive to a change in p $=$ bigger $\frac{dy}{dp}$, y more sensitive



steeper y

$\frac{\Delta y}{\Delta p} \approx \frac{dy}{dp}$

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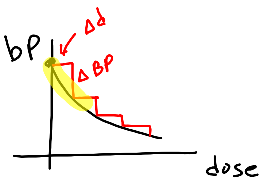


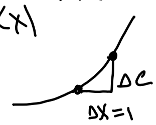
Sep 14-9:56 AM

Derivatives in economics

derivative = "marginal"

Ex 7 p 134 Marginal cost and marginal revenue

$x =$ number of radiators per day
$c(x) =$ Total Cost to produce all x radiators
$r(x) =$ Total Revenue from x radiators
$P(x) =$ profit $= r(x) - c(x)$



$c(x) = x^3 - 6x^2 + 15x$

$r(x) = x^3 - 3x^2 + 12x$

marginal cost to produce 10 radiators

$c'(10) = 300 - 120 + 15 = 195 \approx$ cost of 11^{th} rad.

$c'(x) = 3x^2 - 12x + 15$

$c(10) = 1000 - 600 + 150 = \$550$

$C(11) - C(10)$

$r'(10) = 300 - 60 + 12 = 252$

$r'(x) = 3x^2 - 6x + 12$

revenue for 11^{th} radiator

$P'(10) = 252 - 195$
$= 57$

Sep 20-6:37 PM

Sep 14-10:25 AM